Unemployment dynamics in Eastern Europe; The case of Slovakia

Lubyova, M.; van Ours, J.C.

Published in:
European Economic Review

Publication date:
1997

ELSEVIER

European Economic Review 41 (1997) 925–934

EUROPEAN ECONOMIC REVIEW

Unemployment dynamics and the restructuring of the Slovak unemployment benefit system

Martina Lubyova [a,1,b,c], Jan van Ours [b,*]

[a] *Slovak Academy of Sciences, Bratislava, Slovak Republic*

[b] *Tinbergen Institute, Erasmus University Rotterdam, P.O. Box 1738, 3000 DR Rotterdam, The Netherlands*

[c] *CERGE-EI, Prague, Czech Republic*

Abstract

This paper is about the effects on unemployment dynamics of the restructuring of the Slovak system of unemployment benefits. Using data collected by the public employment offices we investigate the effects of the strengthening of the system which occurred January 1, 1992 and the loosening of the system for some age groups introduced January 1, 1995. We find evidence that the strengthening of the system reduced unemployment duration whereas the loosening increased unemployment duration. However, none of the changes did significantly affect the flow from unemployment to regular jobs. © 1997 Elsevier Science B.V.

JEL classification: C41; J64; J65

Keywords: Unemployment duration; Unemployment insurance

1. Introduction

Like in other Central and Eastern European countries unemployment in Slovakia increased substantially in the beginning of the 1990s. The government has tried to combat unemployment by a range of active and passive labour market policies (see OECD, 1996). An example of the latter policy is the tightening of the unemployment benefit schemes in January 1992 when the replacement ratios were

* Corresponding author. Tel.: (+31)-10 4088900; Fax: (+31)-10 4527347; e-mail: ours@tir.few.eur.nl

[1] Email: Lubyova@pu.savba.sk.

PII S0014-2921(97)00050-0

reduced and entitlement periods were shortened. This meant that the period during which benefits were related to the previous wage was shortened while the period of (sometimes much lower and means tested) subsistence benefits started sooner. The motivation for this measures was two-fold. First, the schemes were getting too expensive as the number of benefit claimants was rising. Second, there was concern about the disincentive effects imposed by the benefit schemes. The system was viewed as too generous since for many unemployed the levels of unemployment benefits (accompanied by social benefits) were relatively high compared to potential wages. In January 1995 there was an opposite policy measure in Slovakia which was unique in Central and Eastern Europe. The benefit schemes were loosened and for some age groups entitlement periods were lengthened.

In this paper we study the effects on unemployment dynamics of both changes in the benefit system. In our analysis we use micro data collected by Slovak public employment offices. Studies using micro data to analyse changes in unemployment benefit systems in Central and Eastern Europe are quite rare. An example is Micklewright and Nagy (1996) in which the effects of the 1993 reform in Hungary are analyzed concluding that this reform did not have a large effect on the outflow from unemployment. In a similar analysis for Slovenia Vodopivec (1995) concludes that although the unemployment exit rate to employment increased just before the potential exhaustion of benefits and decreased after the exhaustion of the benefits, the overall effect on the outflow from unemployment was small.

Our paper is organized as follows: in Section 2 we provide stylized facts about the Slovak labour market and the restructuring of the Slovak unemployment benefit system. Section 3 provides information about our data. Section 4 contains a description of the statistical model and in Section 5 we discuss the results of our empirical analysis. Section 6 concludes.

2. Unemployment and unemployment benefits

Unemployment in Slovakia increased strongly in 1991 from practically zero to 400,000. In the beginning of 1992 there was a decline while there were fluctuations afterwards with the number of unemployed varying between 250,000 and 400,000 and the monthly outflow from unemployment varying between 8% and 10%.

There are large differences with respect to the extent to which Slovak workers are confronted with unemployment. In 1994 the unemployment rate of workers aged 15–24 was 29%, for workers aged 25–49 it was 12%, while for the age group 50–59 it was 8%. Furthermore, there were large differences between educational categories with unemployment rates being lower for higher educated workers: The unemployment rate of workers with basic or no education was 28%, while for academics it was 3%. Finally, there were also large differences between regions, with the unemployment rate of 4% in Bratislava being the lowest and rates of 25–30% in the Eastern parts of Slovakia being the highest.

The first major reform of the unemployment benefit system occurred in January 1992. The eligibility conditions were tightened, eligibility period was halved from 12 to 6 months and the replacement ratios were slightly reduced. Before the change unemployed workers received a benefit of 65% of their previous wage during the first 6 months of unemployment and 60% during the second 6 months. After the change the benefit during the first 3 months was 60% of the previous wage while in the second 3 months it was 50%.

After unemployment stabilized and the financing of the unemployment benefits was shifted from the state budget to the autonomous contributions-based employment fund, government implemented a reform in January 1995: eligibility criteria were set back to the pre-1992 tolerant rules and the eligibility period was prolonged up to 9 months according to the age of unemployed. For workers younger than 30 years the entitlement period did not change, for workers aged between 30 and 45 the entitlement period was lengthened to 8 months, for workers older than 45 years it was lengthened to 9 months [2]. In what follows, we investigate whether the 1992 and 1995 reforms influenced the individual probabilities of leaving unemployment and finding a job. We determine the effects of the reforms by comparing individual unemployment outflow probabilities before and after the change. This means that for the January 1992 change we compare the situations in 1991 and in 1992, while for the January 1995 change we compare the situations in 1994 and 1995. Since the January 1995 change was age dependent we analyze unemployment dynamics caused by this change distinguishing between age groups.

3. Data

We use administrative data from registers of 5 out of the 38 Slovak district labour offices. The 5 districts were selected in order to cover all three main Slovak regions (West, Central and Eastern Slovakia) and all urban types (larger or smaller cities and the country). We did the analysis separately for the 1992 and the 1995 reform of the benefit system using two data sets. The first dataset consists of all workers flowing into unemployment in the first quarters of 1991 and 1992, the second dataset consists of workers flowing into unemployment in the first quarters of 1994 and 1995. The 1991/92 sample includes 10,790 observations, the 1994/95 sample has 18,603 observations.

The datasets only contain complete information on the last unemployment spell of each unemployed. This is due to the overwriting of records in the unemployment register. Record are kept per person as opposed to per spell. If a person is registered repeatedly, the new registration period replaces the previous one.

[2] Starting October 1995 for workers older than 50 years the entitlement period was lengthened to 12 months.

However, the datasets do contain a complete record of payments transferred to the person by the labour office during each of his/her previous spells of registered unemployment. Based on this payment record, we constructed the previous unemployment history.

So, in our analysis we use two types of unemployment spells: those based on unemployment registration and those based on payment records. Register information is more complete. In particular, we have full information on the exact dates of de-registration and the destination states. The register spells which do not reach de-registration by the date of the survey — 31 December 1995 — are considered to be right-censored. For payment record spells we deal with the censoring status in the following way: if the spell-length is shorter than the appropriate entitlement period, the spell is considered to be completed (this is because all the reasons for interrupting the payments before the exhaustion of entitlement are connected with exit to some non-registered-unemployment states). If the spell-length is equal or greater than the entitlement period, it is considered to be censored (for further details about our dataset, see Lubyova and Van Ours, 1996).

In our analysis we also distinguish between exits to a regular job and exits for other reasons. These other reasons include placements into subsidized jobs, displacements from the register because of unacceptable behaviour (lack of cooperation, refusing an offered suitable job), placement into retraining, entering school.

4. Statistical model

We use a proportional hazard model with a flexible baseline hazard. The hazard rate is assumed to be constant *within* time intervals but is allowed to differ *between* time intervals. The specification of the hazard rate is as follows:

$$\Theta(t;x_i,\tau) = \exp\left[\beta' x_i + \sum_k \lambda_k(\tau)\cdot I_{ki}(t)\right] \tag{1}$$

where t is unemployment duration measured in months, x is a vector of explanatory variables and τ is calendar time. Furthermore, i refers to individuals and I_k's, $k = 1, \ldots, n$, are time-varying dummy variables which are one in the monthly time intervals 1–2, 2–3, etc. Finally, β and $\lambda_1, \ldots, \lambda_n$ are parameters to be estimated.

From the pattern of duration dependence we get information about the effect of unemployment benefit schemes. The effect of changes in the benefit system are measured by the differences in the λ_k parameters of two subsequent years. The effect of a change in the benefit system in 1991/92 for duration class k is defined as: $\{\lambda_k(1992) - \lambda_k(1991)\}$. Since the change of the benefit system in 1994/95 only refers to workers aged over 30 years we measure the effect of this change for duration class k as: $\{[\lambda_k(1995) - \lambda_k(1994)]\cdot \mathrm{DUMAGE}\}$, where DUMAGE is a

dummy variable with value 1 if the age of the worker is over 30 years and with a value 0 otherwise.

The hazard rate specified in Eq. (1) is a 'single risk' hazard rate, that is it describes the outflow from unemployment without a distinction between possible destinations. We also consider the case in which an unemployed worker faces two 'risks': one of completing his/her unemployment benefit period by finding a regular job, the other of completing of the unemployment benefit period because of other reasons. We estimate the coefficient of both hazard rates separately. When estimating the coefficients of the 'job finding hazard rate' the observed durations until a regular job is found are considered to be completed durations while the durations until an exit for other reasons or exits until the exhaustion of the benefit period are considered to be right-censored. The estimation of the coefficients of the 'for other reasons' hazard rate is done in a similar way.

The explanatory variables we use refer to sex, age, education, marital status, nationality, regional district and inflow year (Appendix A gives the definitions of the variables). The density function of completed unemployment durations is specified as:

$$f(t;x_i,\tau) = \Theta(t;x_i,\tau)\cdot\exp\left[-\int_0^t \Theta(s;x_i,\tau)\,\mathrm{d}s\right] \tag{2}$$

If we define an indicator variable d_i that is equal to 1 if the duration is completed and is equal to 0 otherwise the loglikelihood is specified as:

$$\log L = \sum_{d_i=1} \log[f(t;x_i,\tau)] + \sum_{d_i=0} \log[1-F(t;x_i,\tau)] \tag{3}$$

where $F(t)$ is the distribution function of $f(t)$.

5. Estimation results

We estimated the parameters of the model using maximum likelihood. Tables 1 and 2 show the results. The first columns of these tables contain the estimates of the single risk models. The second and third columns contain the results for the hazard rates with a regular job as destination and for the hazard rates connected to other destinations. Since from a likelihood ratio test it appears that the competing risk model contains more information than the single risk model we restrict the discussion of our estimation results to the second and third columns [3]. First, we discuss the results of the estimates with respect to the explanatory variables. Then,

[3] This likelihood ratio test compares the value of the log-likelihood of the competing risk model, evaluated at the maximum, with the value of the single risk model, evaluated at the maximum, plus the logarithm of 1/2 times the number of uncensored observations.

Table 1
Estimation results 1991/92

	All destinations	Regular job	Other destinations
Constant	−3.06 (27.2)	−7.07 (26.3)	−3.59 (19.6)
Sex (male = 1)	0.09 (3.9)	0.09 (2.0)	0.10 (3.4)
Age 30–45	−0.04 (1.6)	0.01 (0.1)	−0.05 (1.7)
Age > 45	0.01 (0.2)	0.07 (1.1)	−0.00 (0.1)
Education 1	−0.65 (13.6)	−0.21 (2.1)	−0.63 (10.8)
Education 2	−0.24 (5.4)	0.66 (7.1)	−0.51 (9.1)
Education 3	−0.19 (4.0)	0.72 (7.9)	−0.58 (9.2)
Single	0.17 (3.6)	1.92 (18.9)	−0.28 (4.7)
Married	0.16 (3.8)	1.96 (20.8)	−0.32 (6.1)
Hungarian	−0.43 (4.6)	−0.53 (3.8)	−0.36 (3.2)
Gypsy	−1.10 (19.6)	−1.93 (14.1)	−0.76 (12.2)
Disabled	−0.45 (7.5)	−0.74 (7.4)	−0.25 (3.5)
Inflow 1992	1.24 (11.6)	0.69 (5.1)	1.90 (10.4)
District 2	0.18 (4.0)	1.96 (9.4)	−0.24 (4.6)
District 3	−0.11 (2.3)	1.46 (7.0)	−0.41 (7.7)
District 4	−1.23 (18.6)	0.13 (0.6)	−1.40 (19.1)
District 5	−0.03 (0.6)	1.25 (6.0)	−0.20 (4.3)
Duration dependence 1991:			
Month 1–2	0.07 (0.5)	−0.19 (1.0)	0.47 (2.1)
Month 2–3	−0.06 (0.4)	−0.17 (0.9)	0.17 (0.7)
Month 3–4	−0.20 (1.3)	−0.57 (2.6)	0.32 (1.3)
Month 4–5	−0.26 (1.6)	−0.50 (2.3)	0.13 (0.5)
Month 5–6	−0.19 (1.2)	−0.37 (1.8)	0.13 (0.5)
Month 6–7	−0.12 (0.8)	−0.27 (1.3)	0.17 (0.7)
Month 7–8	0.03 (0.2)	−0.34 (1.6)	0.55 (2.3)
Month 8–9	−0.17 (1.0)	−0.41 (1.9)	0.25 (1.0)
Month 9–10	0.44 (3.1)	−0.40 (1.8)	1.23 (5.9)
Month 10–11	0.75 (5.6)	−0.31 (1.4)	1.63 (8.0)
Month 11–12	0.64 (4.6)	−0.48 (2.0)	1.54 (7.4)
Month 12+	0.05 (0.4)	−0.56 (4.0)	0.74 (4.1)
Entitlement effects 1992:			
Month 1–2	0.13 (0.8)	−0.18 (0.9)	−0.05 (0.2)
Month 2–3	−0.05 (0.3)	−0.27 (1.3)	−0.12 (0.5)
Month 3–4	0.59 (3.6)	0.25 (1.0)	0.35 (1.4)
Month 4–5	0.36 (2.1)	−0.15 (0.6)	0.26 (1.0)
Month 5–6	0.44 (2.6)	0.29 (1.3)	0.27 (1.0)
Month 6–7	−0.90 (4.8)	−0.28 (1.2)	−1.80 (5.9)
Month 7–8	−1.02 (5.6)	−0.16 (0.6)	−2.17 (7.4)
Month 8–9	−0.59 (3.1)	−0.25 (1.0)	−1.10 (3.9)
Month 9–10	−1.52 (8.4)	−0.69 (2.4)	−2.32 (9.0)
Month 10–11	−1.91 (10.5)	−0.79 (2.7)	−2.85 (11.0)

Table 1 (continued)

	All destinations	Regular job	Other destinations
Month 11–12	−1.80 (9.6)	−0.73 (2.3)	−2.70 (10.3)
Month 12+	−1.30 (11.0)	−0.68 (4.3)	−2.01 (10.4)
−Loglikelihood	27,310	10,759	10,790

t-Values in parentheses.

we discuss the results with respect to duration dependence in the year before the change in the benefit system. Finally, we discuss the effects of this change [4].

For the exit rates to a regular job the effects of the explanatory variables are quite the same in 1991/92 and in 1994/95. It appears that males have a higher exit rate than females. Age is not very important. So, the highly age related differences in unemployment rate are mainly due to differences in inflow into unemployment and not due to differences in unemployment duration. Furthermore, unemployed with a low education have a very low exit rate to a regular job. The effect of education on the outflow from unemployment has become more important over the years. Both single and married unemployed have a larger probability of finding a job, whereas for disabled workers and workers with a gypsy or Hungarian nationality the probability of finding a job is substantially lower. Finally, there are quite large differences between the regions which have changed over time.

For the exit rate to other destinations the effects are mostly similar except for education and marital status. Education and marital status seem to be the main determinants distinguishing between the two destinations of the outflow from unemployment.

The exit rate to a job in 1991 shows a decline in the first months of unemployment but other than that it does not change a lot over the duration of unemployment. So, there does not seem to be an end-of-entitlement effect. There is such an effect for the exit rate to other destinations which increases substantially after 9 months. Apparently the end of the entitlement induces unemployed to leave unemployment but not by taking a regular job. Instead they leave unemployment presumably to accept a subsidized job. Neither the exit rate to a job nor the exit rate to other destinations give an indication of an end-of-entitlement effect in 1994.

Now the question that remains to be answered is whether the changes in the length of the entitlement periods have influenced the exit rates out of unemployment. In 1991/92 this is not clear for the exit rate to a job. There is a decline of

[4] We also investigated whether an unobserved heterogeneity component specified as a discrete distribution with two point of support was present in the hazard rate but we did not find any indication of this.

Table 2
Estimation results 1994/95

	All destinations	Regular job	Other destinations
Constant	−3.36 (61.7)	−7.28 (46.5)	−3.32 (50.5)
Sex (male = 1)	0.30 (16.2)	0.41 (13.4)	0.24 (10.1)
Age 30–45	0.03 (1.3)	0.07 (1.5)	0.02 (0.6)
Age 45 +	0.01 (0.3)	0.03 (0.4)	0.01 (0.2)
Education 1	−0.72 (16.7)	1.58 (13.6)	−1.00 (18.2)
Education 2	−0.15 (3.9)	2.37 (21.4)	−0.65 (13.4)
Education 3	−0.19 (4.8)	2.29 (20.6)	−0.65 (12.6)
Single	0.19 (4.9)	0.83 (11.2)	−0.11 (2.1)
Married	0.12 (3.4)	0.90 (13.1)	−0.30 (6.5)
Hungarian	−0.30 (8.7)	−0.26 (5.1)	−0.24 (5.2)
Gypsy	−0.91 (12.2)	−1.60 (10.6)	−0.49 (5.5)
Disabled	−0.80 (13.4)	−1.01 (11.0)	−0.60 (7.8)
Inflow 1995	0.37 (14.3)	0.44 (11.2)	0.31 (10.2)
District 2	0.76 (18.5)	1.08 (13.7)	0.57 (11.7)
District 3	0.61 (15.0)	0.57 (7.0)	0.65 (13.9)
District 4	0.47 (10.9)	0.36 (4.3)	0.54 (10.9)
District 5	0.62 (15.4)	0.82 (10.5)	0.51 (10.8)
Duration dependence 1994:			
Month 1–2	0.42 (10.4)	0.30 (4.8)	0.50 (9.6)
Month 2–3	0.19 (4.2)	0.05 (0.7)	0.28 (5.0)
Month 3–4	0.34 (7.6)	0.12 (1.7)	0.48 (8.5)
Month 4–5	0.33 (7.3)	0.05 (0.7)	0.51 (8.9)
Month 5–6	0.38 (8.1)	0.20 (2.6)	0.51 (8.6)
Month 6–7	0.20 (3.9)	0.15 (1.8)	0.25 (3.7)
Month 7–8	0.26 (5.0)	0.23 (2.8)	0.30 (4.4)
Month 8–9	0.22 (4.0)	0.19 (2.2)	0.26 (3.6)
Month 9–10	−0.21 (3.0)	−0.35 (3.1)	−0.11 (1.2)
Month 10 +	−0.07 (1.8)	−0.13 (2.0)	−0.03 (0.4)
Entitlement effects 1995:			
Month 1–2	−0.24 (4.2)	−0.15 (1.7)	−0.32 (4.2)
Month 2–3	0.17 (2.9)	0.23 (2.4)	0.12 (1.6)
Month 3–4	−0.05 (0.8)	−0.06 (0.5)	−0.05 (0.6)
Month 4–5	−0.39 (5.4)	−0.26 (2.2)	−0.47 (5.2)
Month 5–6	−0.43 (5.8)	−0.31 (2.6)	−0.52 (5.4)
Month 6–7	−0.05 (0.6)	−0.05 (0.4)	−0.06 (0.6)
Month 7–8	−0.04 (0.5)	−0.04 (0.3)	−0.06 (0.6)
Month 8–9	−0.06 (0.7)	−0.12 (0.9)	−0.03 (0.3)
Month 9–10	0.07 (0.7)	0.01 (0.1)	0.10 (0.7)
Month 10 +	−0.69 (5.8)	−1.01 (4.7)	−0.52 (3.7)
−Loglikelihood	42,590	19,527	29,396

t-values in parentheses.

the exit rate in 1992 relative to the exit rate in 1991 at higher duration classes, but this starts after 9 months so the reason is not clear to us. For the exit rate to other destinations we find a large effect: after 6 months there is a substantial drop in this exit rate. So, right after the entitlement period the exit rate to other destinations is very low. Again as the end of the entitlement period comes near unemployed seem inclined to leave unemployment but not by accepting a regular job.

For 1994/95 we observe an entitlement effect for both the exit rate to a regular job and the exit rate to other destinations. In 1995 in the fifth and sixth month of unemployment both exit rates are substantially lower than in 1994, indicating that because the entitlement period has been lengthened unemployed are less inclined to leave the unemployment register in these months causing an increase in average unemployment durations.

6. Conclusions

This paper is about unemployment and the restructuring of the Slovak system of unemployment benefits. Using data collected by the public employment offices we investigated the effects of changes in the entitlement period which occurred in 1992 and 1995. We find evidence that these changes affected the outflow from unemployment to destinations other than regular employment. For the 1992 change we find that the reduction of the entitlement period induced unemployed to leave the unemployment register sooner, but not to go to a regular job. Presumably the inflow into subsidized jobs increased. For the 1995 change we find that unemployed of age groups for which the entitlement period has been lengthened stay unemployed for a longer period.

All in all we find little if any effect of the changes in the benefit system on the outflow from unemployment to a job. Financial incentives seem to affect unemployment durations but do not seem to affect job finding behaviour.

Acknowledgements

The research of Martina Lubyova was undertaken with support from the European Commission's PHARE-ACE Programme 1994.

Appendix A. Definitions of variables

— sex: dummy variable, male = 1, female = 0;
— education — three dummy variables:

education 1: basic education
education 2: uncompleted secondary education

education 3: completed secondary and higher education
reference group: incomplete basic or no education

— marital status — two dummy variables:

single
married
reference group: other marital status (unknown, divorced, widow(er))

— nationality — two dummy variables:

Gypsy
Hungarian
reference group: other nationalities

— disabled: dummy variable, if classified as disabled = 1, otherwise = 0

— inflow year — two dummy variables:

Inflow 1992
Inflow 1995
reference group: inflow in 1991 or 1994

— district — four dummy variables:

district 2: Martin
district 3: Nove Zamky
district 4: Roznava
district 5: Michalovce
reference group: Trencin

References

Lubyova, M. and J.C. van Ours, 1996, Unemployment dynamics in Eastern Europe: the case of Slovakia, Working paper (Tinbergen Institute, Rotterdam).

Micklewright, J. and G. Nagy, 1996, Labour market policy and the unemployed in Hungary, European Economic Review 40, 819–828.

OECD, 1996, Labour Market and Social Policies in the Slovak Republic (OECD, Paris).

Vodopivec, M., 1995, The Slovenian labor market in transition: Evidence from micro data, OECD workshop on What can we learn from the experience of transition countries with labour market policies? (Vienna, Nov. 30–Dec. 2, 1995).